UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
841 Chestnut Building
Philadelphia, Pennsylvania 19107

JUL 28 1987

Joel Schneider, Esq.
Frumkin & Manta
1818 Three Penn Center Plaza
Phila. Pa. 19102

Re: Ambler Asbestos Site - Remedial Investigation

Dear Joel:

Enclosed please find a 'Field Activity Summary' report prepared by Roy F. Weston, Inc. on the remedial investigation at the above-named site.

Please contact me at (215) 597-9951 should you have any questions with respect to the above.

Sincerely yours,

Lydia Isales
Assistant Regional Counsel

Enclosure

cc: Virginia Gibson-Mason, Esq.
David Street, Esq.
Hector Abreu

AR001691

## FIELD ACTIVITY SUMMARY

### 1. INTRODUCTION

### 1.1 PURPOSE

The purpose of this Field Activity Summary is to update EPA on the field activities performed to date as a part of the Remedial Investigation of the Ambler Asbestos Piles (AAP) Site located in the Borough of Ambler, Montgomery County, Pennsylvania. Phase 1A, 1B, and 1C as outlined in the Final Work Plan and the Project Operations Plan prepared for this site have been completed. A Post Phase 1C field activity will be performed and completed in July 1987.

### 1.2 SCOPE

The scope of this summary is to outline the survey and sampling activities performed during the field investigation, and present a brief description of the sampling and health and safety measures procedures followed during the three-phased sampling program. The results of the chemical and physical testing of samples and their analysis are not presented in this summary. Sample

analysis and the validation of these data are in progress. Detailed sampling procedures and validated testing results will be presented in the draft RI report scheduled for completion by September 1987. The general activities performed in the field investigation were:

PHASE 1A
Surveys

- o Cover/cap/slope
- o Stream and drainageway(including up and downstream)
- o Visible signs of asbestos
- o Lagoon area
- o Hand augering around perimeter of piles

PHASES 1A, 1B, AND 1C
Sampling

- o Surface Water (lagoon, draingeway, stream - Hazardous Substance List, Organics and Inorganics, and asbestos analysis)
- o Air (environmental source/receptor, and personnel - asbestos analysis)
- o Cover soils (physical and engineering parameter testing)

o Sediment sampling (lagoon,drainageway, and stream - HSL Organic and Inorganic, and asbestos analysis)

o Test pit excavation - sample testing (EP Tox analysis for HSL Organic and Inorganic analysis, physical engineering properties, and asbestos content)

o Borings - sample testing (EP Tox analysis for HSL Organic and Inorganic analysis, physical and engineering properties, and asbestos content)

## 2.0 PROJECT DESCRIPTION

The Ambler Asbestos Piles site is located in the southwestern portion of the Borough of Ambler, Montgomery county, Pennsylvania. The site is bordered on the west by Wissahickon creek and its flood plain; on the northwest by Butler Pike, a major transportation route; on the north by Locust street; and on the southeast by Church Street. A portion of the site extends westward from Ambler into Upper Dublin Township, Montgomery County

The Ambler site has been the location of almost a century of manufacturing operations in which the primary waste contained asbestos fibers. The Keasby and Mattison Company owned the project site from the late 1800s to 1962. The company initially operated as a pharmaceutical company until the early 1900s. During the World War I, however, the Keasby-Mattison plant became one of the leading producers of asbestos products. During the period when asbestos was manufactured, waste from asbestos product manufacturing was disposed of in two piles on the company property next to the manufacturing facility ( the Locust Street and Plant Piles), and also in other areas of Ambler.

In 1962, Certainteed Corporation, a manufacturer of asbestos and cement pipes, purchased a portion of the site and plant facilities from Keasby-Mattison, including the pipe manufacturing plant and the Pipe Plant Dump. Nicolet Industries, Inc., a manufacturer of building and automobile supplies, purchased the remaining plant facilities along with the Locust Street Pile, the Plant Pile, and the asbestos filter bed lagoons. After purchasing the properties, both companies added their wastes to the piles. Nicolet has maintained that they have disposed of asbestos waste only on the Plant Pile. Waste disposal on both piles was ceased in 1978-79. In October 1984, the Ambler Asbestos Piles site was proposed to be included on the EPA Superfund National Priorities List and was designated as an enforcement site.

The purpose of the RI/FS to be performed for this site is to determine if potential public health risks and environmental impacts exist at the subject site and if additional remedial action is needed. This determination will be based on an Endangerment Assessment following EPA guidelines. Under CERCLA, an Endangerment Assessment must be conducted for NPL - listed sites, including all enforcement sites. The endangerment assessment as a minimum will address existing and potential hazards to public health and/or the environment in the absence of additional response actions (No action). In order that an endangerment assessment can be completed, the following objectives must be met:

- Locate immediate and/or potential sources of asbestos release by identified pathways of migration (surface water, air) that can reach sensitive receptors resulting in public health risks.
- Identify contaminants other than asbestos that may pose an immediate or potential risk to public and/or the environment.
- Verify whether the site is securely closed as a result of the previous "Removal Actions" (if no pathways for asbestos or other contaminant release are found in quantity or concentration that pose a risk to human health or the environment).
- Develop technically feasible, environmentally safe, and cost-effective remedial action alternatives if it is determined from the RI that additional remedial action is necessary.

## 3.0 PROJECT REFERENCE DOCUMENTS AND PROCEDURES

Sampling activities were performed in general accordance with the Final Work Plan (June 5, 1986) and the Project Operations Plan (December 18, 1986) for the Ambler Asbestos Piles site. Minor modifications which occurred in the field are discussed in this report.

## 4.0 SUMMARY OF RI FIELD INVESTIGATION ACTIVITIES PERFORMED TO DATE

### 4.1 OBJECTIVE

The field investigation is designed to supply information needed for the Remedial Investigation/Feasibility Study (RI/FS) in order to fill data gaps and document the degree and extent of site contamination which may presently exist. Table 4-1 outlines the two-phased field investigation program, the tasks to be performed, and the objectives to be met. The task objectives listed in Table 4-1 relate to the tasks under each phase and subphase. A phased approach was taken to identify at an early stage potential areas requiring further investigation and testing. Phase I was subdivided into three distinct subphases; site survey, non-intrusive sampling, and intrusive sampling. Greater safety measures were taken during intrusive sampling. Air sampling was performed during the survey and sampling programs. Tasks listed under subphases 1A, 1B, and 1C have been performed to date. A Post Phase 1C will be completed in July 1987 and include the final round of source/receptor air sampling, additional surface water sampling under low flow conditions, and the sampling of selected piezometers installed on and around the piles. The Post Phase 1C activities will not be performed until analytical data are received for air, surface water, and waste samples taken in earlier phases. When validated data from the Phase 1 sampling become available, the need to perform any additional Phase 2 sampling will be determined.

A description of the activities, the health and safety measures implemented, general sampling procedures, and other miscellaneous activities performed to date is presented below.

## 4.2 SITE MOBILIZATION

For the purpose of field investigation a mobile field office was transported on-site and stationed by the dirt access road to the Locust Street pile as shown on Figure 4-1. Another trailer was stationed by the side of the mobile office for field equipment storage purposes. These facilities were located in the contamination reduction zone. These activities took place on 15 December 1986. The electricity service for the mobile office was obtained on 29 January 1987. Electricity was connected on 16 February 1987.

On 2 March 1987, a geotextile and stone decontamination pad and the initial stone access roads were constructed by Hardin Huber Inc., subcontractors to REM II. The decontamination pad was constructed adjacent to the dirt access road leading to the Locust Street pile to allow ease of access for the drill rig, backhoe and other equipment used for the field investigation. The decontamination pad was constructed by first excavating out a 30'x18' area 1.0 to 1.5 feet deep and backfilling the area with free flowing fine to coarse gravel. The excavated soil was used to construct berms on the sides of the pad to control drainage. The gravel was then covered with a nonwoven needlepunched geotextile fabric to filter the decontamination washwater. The decontamination pad is graded to drain to the adjacent drainage swale after filtering. The fabric was changed twice during the field investigation.

The initial access roads were constructed on both the Plant Pile and the Locust Street Pile to provide access for the drill rig to perform borings at the top of the piles, to minimize rutting and damage to cover soil on the piles, and to control the creation of dust due to movement of the drill rig and support vehicles. The location of these access roads as initially constructed are shown on Figure 4-1. During the field investigation, it was found necessary to construct additional access roads due to soft surface conditions on the piles in order to access designated drilling and test pit locations. After discussion and approval by EPA these additional access roads were constructed by Hardin Huber, Inc. on 13 April 1987 (also as indicated on Fig.4-1).

A health and safety orientation was given by the designated WESTON Site Health and Safety Coordinator to the subcontractor and WESTON personnel entering the site. A log of personnel leaving and entering the site and safety orientations was kept.

The hazards of asbestos and the use of personnel safety equipment was explained at the orientations. The use of powered air purifying respirators, personnel decontamination procedures, and other physical hazards (steep slopes, ice, and heavy equipment) were also explained. Level C safety protection was used for all intrusive activities.

4.3 PHASE 1A

The Phase 1A activities were performed to inspect the site thoroughly at the beginning of the RI field investigation. (It involved non-intrusive activities such as site survey, air sampling and preparatory measures for the remaining activities.) These activities were performed in the months of December 1986 and January 1987.

4.3.1 SITE SURVEYS

Detailed site surveys were conducted to determine and document site conditions. The following surveys were conducted and information from the surveys documented.

- o Visual inspection for the presence of any potential sources that could release asbestos (exposed areas of asbestos and contaminated soil/waste in and around the waste piles);

- o Visual inspection of cover/cap system (signs of failure, variation in cover material, etc.)

- o Visual inspection of the lagoon area, stream and drainageways;

- o Tentative locations for detailed sampling activities during Phase 1B and 1C were chosen and staked;

- o Tentative locations for borings and test pits (intrusive activities) in Phase 1C were chosen and staked.

4.3.2 AIR SAMPLING

The air sampling program being performed at the Ambler Asbestos Site is a multi-faceted and state-of-the-art program which consists of the following components:

- o Environmental air sampling - The purpose of this sampling is to document on-site ambient air conditions before, during, and after intrusive field activities. Samples included four on-site sample locations, with both up and downwind conditions being represented.

- o Source/Receptor Air Sampling - The purpose of this extensive sampling program is to determine the ambient air conditions up and downwind of potential on-site sources (exposed areas) and at possible off-site receptors (residences). Up to 24 source/receptor sampling stations are included in this program.

o Personnel Air Sampling - Personnel air sampling was performed during soil boring and test pit activity. Personnel air sampling is required by OSHA for these activities.

Environmental Air Sampling - Phase 1A

The first round of Environmental air samples was taken during Phase 1A on 29 December 1986. Four sampling locations were established based on weather conditions on the day of sampling. Sample locations included one off-site upwind station, two on-site stations on the Locust Street Pile and one on the Plant Pile. Samples stations are shown on Figure 4-2. Air samples were taken using high volume air pumps collected on 25 mm polycarbonate filters in nonconductive cassettes. Flow rates were measured during sampling. Pumps ran for an average of 4 hours. Temperature, wind speed and direction were monitored during air sampling. Both a field and trip blank were taken. All samples were sent to a CLP-SAS laboratory for asbestos analysis using Transmission Electron Microscopy (TEM). Table 4-2 provides a summary of the numbers of samples collected and analyzed for all phases of the field investigation.

Source/Receptor Air Sampling - Phase 1A

The first of three sets of source/receptor air sampling was completed during Phase 1A on 9 January 1987. A total of seven (7) on-site source and fourteen (14) receptor air sampling stations were established and samples taken using high volume air pumps. Air samples were collected on 25 mm polycarbonate filter in nonconductive cassettes. Figure 4-3 presents the sampling locations for source/receptor air sampling. Source locations were determined based on the site survey. Areas of the piles where asbestos containing soil/waste was exposed and the filter bed lagoons were chosen for source air sampling. Receptor locations were identified the day of sampling based on wind speed and direction, air particulate transport and dispersion, and the location of residences and local businesses. Off-site upwind receptor air samples were also taken to establish background levels.

Pumps ran for an average of 4 hours. Flow rates were measured during air sampling. Temperature, wind speed, and direction were monitored by an on-site meteorological station located on top of the Plant Pile. Two field and one trip blank was taken as well as two duplicates. All samples were sent to a CLP-SAS laboratory for asbestos analysis using TEM on 27 March 1987.

## 5.0 PHASE 1B

Phase 1B of the Field Investigation involved non-intrusive sampling activities. The sample locations were selected based on the information obtained in Phase 1A and previous sampling performed by EPA prior to the Removal Action. In this phase, surface water (stream and lagoon), spring/seep samples, and cover soil samples were collected. The Phase 1B activities were performed during the months of January through April 1987.

## 5.1 SURFACE WATER SAMPLES

Surface water samples were collected from the lagoon, Wissahickon Creek, and the drainageway leading from the lagoon to Wissahickon Creek. A total of seven samples were collected from the filter bed lagoons and the drainageway. Surface water samples from Wissahickon Creek were collected up- and down-stream of the site. Surface water sample locations are presented on Figure 5-1.

Surface water samples for organic and inorganic analysis were collected and shipped to designated CLP laboratories on 15 January 1987. Surface water samples for asbestos analysis were collected on 30 March 1987 and shipped on 1 April 1987 to a CLP-SAS Laboratory. Table 4-21 provide summaries of the numbers of samples collected and analyses performed.

## 5.2 SPRING/SEEP SAMPLES

Spring/Seep samples were collected from the toe of the waste pile slopes and in the low flat flood plain area between the piles and Wissahickon Creek. The location of the Spring/seep samples are shown on Figure 5-1. Spring/seep samples were collected on the same dates as is noted for the surface water samples.

## 5.3 COVER SOIL SAMPLES

Cover soil samples were collected from the cover which had been installed on the slopes of the piles. These samples were collected for determining the physical characteristics of the existing cover system. Two types of cover soil samples were collected; grab samples and 2-inch diameter Shelby tube samples. The location of the cover soil samples are shown on Figure 5-2. A summary of the physical testing program for cover soils samples and waste (boring and test pit) samples is presented in Table 5-1. A total of 20 grab samples and 11 Shelby tube samples were collected.

# 6.0 PHASE 1C

The Field Investigation Phase 1C involved intrusive activities such as soil borings, installation of piezometers and test pits, sediment sampling, and personnel, and environmental air sampling. These activities started in March 1987 and were finished in early May 1987.

## 6.1 SOIL BORINGS

Soil borings were drilled through the Locust Street Pile and the Plant Pile. The drilling of soil borings was performed by Bowser-Morner, Inc., a subcontractor to REM II. A total of twelve borings were drilled to the virgin soil below the piles. The sampling program for these borings involved sampling for both chemical analysis (Hazardous Substance List Chemicals and Asbestos) and physical testing. The locations of the borings are shown on Figure 6-1.

Health and safety protocols were presented to the drilling personnel and all equipment was checked before any work was initiated, and also periodically throughout the drilling program. A designated Site Health and Safety Coordinator was present at the site during drilling. The boring activities were performed under Level C protection for the personnel in the hot zone (area immediately surrounding the drill rig area). The hot zone was monitored during the drilling activities (using an HNU detector) for any detected volatile organics. No significant readings were observed on the HNU during the boring activities except for B-5 (3ppm). Daily personnel air samples were collected using a personnel air pump attached to the belt of the driller with the air filter attached at the shoulder (see Subsection 6.5 for further detail).

Sampling depths were determined during boring operations by the Site Engineer or his Designated Technical Lead after, visual inspection of the material obtained from the borings. Samples were selected from each different waste layer and sent to the laboratory for hazardous Substance List organic and inorganic (EP.Tox) analysis and asbestos content analysis, in order characterize the different waste strata encountered at the site. A summary of the numbers of samples collected and analyses performed, is presented in Table 4-1. The samples for chemical analysis were collected in appropriately labeled bottles and shipped according to the procedures outlined in the POP. Grab and Shelby tube samples were collected for physical testing. A summary of the physical testing program is presented in Table 5-1.

The excess soil/waste obtained from the borings were drummed for later disposal. These materials will likely be shipped off-site to a local landfill, based upon our most recent discussions with EPA. After completing each boring the drill rig, the sampling equipment and supporting vehicles were all thoroughly decontaminated.

## 6.2 INSTALLATION OF PIEZOMETERS

During the boring activities it was found that the profile of the soil/waste observed in the piles were different from that which had been expected earlier. The top 10 to 15 feet of the piles consisted of spongy fibrous material which was considered to possess a high asbestos content. The underlying material (overlying the virgin soil) was found be a white chalky material, which was soft and highly saturated at lower depths. Therefore, it was decided to install additional piezometers through the piles to monitor the water level in the piles and to test the leachate collecting in the piezometers. Two piezometers at the base of the piles were originally planned. The additional work was approved by EPA and PA DER during the site meeting on 1 April 87. A total of eight piezometers were installed; five through the top of the piles, (3 on the Locust Street Pile and 2 on the Plant Pile), two in the flood plain area and one in the playground area. The locations of the piezometers are shown in Figure 6-1. The piezometers were developed during the weeks of May 11-22, 1987 and water levels were observed and recorded. Continued water level monitoring will be performed until the piezometers are sampled in July 1987. Water level information will be used for performing stability analyses of the piles.

### 6.3 EXCAVATION OF TEST PITS

Four (4) test pits were excavated into the southern side slopes of the piles; two on the Locust Street Pile and two on the Plant Pile. The test pits were excavated by Hardin Huber Inc., on 13 and 14 April 1987 using a backhoe. Daily personnel air samples and a set of environmental air samples were collected during this activity. Soil/waste samples were collected for both chemical analysis (HSL organics and inorganics (EP Tox), and asbestos) and physical testing. The locations of the test pits are shown on Figure 6-1. The numbers of samples extracted and analyses to be performed are summarized on Table 4-2.

The test pits were backfilled with the material that was excavated, and then covered with the cover material to the previously existing grades. Additional cover soil will be needed to cover these areas and to fill in ruts made by the drill rig in the flood plain area due to wet weather conditions during piezometer and test pit construction. This work will be performed in July 1987.

### 6.4 SEDIMENT SAMPLES

Sediment samples were collected from Wissahickon Creek, the asbestos filter bed lagoon, and the ditch leading from the lagoon to Wissahickon Creek. The location of the eight (8) sediment samples collected are shown on Figure 5-1. Table 4-2 summarizes the numbers of samples taken and analyses to be performed.

### 6.5 AIR SAMPLES

#### 6.5.1 ENVIRONMENTAL AIR SAMPLES

The second set of environmental air samples was collected towards the end of the intrusive field activities (19 April 1987) of Phase 1C to determine if the ambient air conditions were affected by the intrusive field activities. Environmental air samples were collected up- and down-gradient of test pit and drilling activities at on-site locations. Four sampling stations were established and air samples were collected. The locations of the second round of environmental air samples are presented on Figure 4-2. A final round of environmental air sampling is scheduled for July 1987.

#### 6.5.2 PERSONNEL AIR SAMPLING

Personnel air sampling and analysis was performed during intrusive (test pits and borings) as required by OSHA regulations for work in which asbestos materials are handled. Daily monitoring of the drill crew and backhoe operator was performed using a Gillian personnel air pump and a mixed cellulose ester air filter. Air pumps were calibrated daily before pumps were turned on and after turning them off.

Pump times varied depending on the time the drill crew was at the rig. A total of thirteen (13) samples were sent to the designated CLP-SAS laboratory for analysis by NIOSH method 7400 - phase contrast microscopy as required under OSHA.

## 7.0 POST PHASE 1C

After all intrusive sampling was completed, the second round of source/receptor air sampling was performed on 21 April 1987. Seven on-site source and eighteen receptor air samples were collected (including 2 duplicates).

Samples were collected using high volume air pumps and collected on 25 mm polycarbonate air filters. Samples were shipped on 5 May 1987 to the designated CLP-SAS laboratory for asbestos analysis by TEM. Figure 7-1 presents the sampling locations for the second round of source/receptor air sampling. Weather conditions were monitored during sampling by an on-site meteorological station.

The final field activities for the RI will be performed in July 1987. The activities include a final (third round) of source/receptor air sampling (the final round of environmental air sampling will be incorporated into this air sampling program) and sampling of selected piezometers. The final round of air sampling will not be performed until results of the first two source/receptor air sampling efforts are received and reviewed, in order that final round sampling locations can be better defined.

TABLE 4-1

| PROJECT OBJECTIVES | TASK OBJECTIVES | PHASE | A | OC | | TASK DESCRIPTIONS |
|---|---|---|---|---|---|---|
| 1. Provide required data for the Endangerment Assessment (mandated by CERCLA for enforcement-lead work assignments) | o Determine the extent of the asbestos waste and process waste containing asbestos in and 100 feet from the identified waste piles that is 2 feet or less below the existing surface, and identify by visual inspection any potential sources from which asbestos can be released to the environment. This includes inspection of the cover, the side slopes of the piles, and the filter bed lagoons. | PHASE 1A INITIAL INSPECTIONS | | | | SURVEYS |
| o Located any sources of asbestos which can be released to the environment. | | This phase identifies by visual inspection and hand-augering potential areas of existing or future release of asbestos fibers. Exact sampling locations will be determined. | X | - | * | Air samples (Environmental) |
| o Search for contaminants other than asbestos. | | | - | - | | Cover/cap/slope |
| | | | - | - | | Stream & Drainageways (including up- and downstream) |
| | | | - | - | | Visible signs of asbestos |
| | | | - | - | | Lagoon Area |
| | | | - | - | | Hand auger around piles perimeter (including playground area) |
| 2. Investigate existing conditions & effectiveness of "Removal Action - 1984" (towards minimizing pathways for asbestos release). | o Determine if asbestos is present in surface waters and shallow underground recharge waters that through evaporation and discharge into Wissahickon Creek could result in potential public health and environmental impacts. Evaluate the physical characteristics of the cover material to assess the present and anticipated future condition of the cover materials over the two identified asbestos waste piles. | PHASE 1B INVESTIGATE/DOCUMENT SITE CONDITIONS (non-intrusive) | | | | SAMPLING |
| 3. Develop technically feasible, environmentally and cost effective remedial action alternatives, if it is determined from the RI that additional remedial action is necessary. | | | X | - | * | Stream (upstream, downstream and at site) |
| | | | X | - | * | Drainageways |
| | | | X | X | ** | Lagoon discharge/contents |
| | | | X | X | * | Springs/seeps |
| | | | - | - | ** | Cover soils - physical and permeability |
| | | | X | | | Air samples (source/receptor |
| | o Determine if there exists present and potential impacts on the adjacent Wissahickon Creek from the site. Obtain data to characterize the piles both from a physical/structural and compositional viewpoints. Evaluate present and future slope stability and potential settlement of the waste piles as well as other on-site physical features that would effect contaminant migration, containment, and/or cleanup. | PHASE 1C INVESTIGATE/DOCUMENT SITE CONDITIONS (intrusive) | | | | ADDITIONAL SAMPLING |
| | | | X | X | * | Sediment sampling (lagoon, drainageway, and stream) |
| | | | X | X | ** | Test Pits (leachate extrac., phys. prop's, composition) |
| | | | X | X | ** | Borings (depth of waste/log piles, leachate extrac., composition, phys. prop.) |
| | | | X | - | * | Air (Environmental, & personnel) |
| | | POST PHASE C | X | | * | Air (Environmental, source/receptor) |
| | o If contaminants of concern other than asbestos are found. | PHASE 2 SUPPLEMENTAL | - | X | | Ground water wells and Sampling |

KEY
- A -Testing for Asbestos
- OC -Testing for other contaminants
- * -To determine impacts on environment/public (existing)
- ** -To determine potential future impacts on environment/public

AR001703

TABLE 4-2

SUMMARY OF AMBLER ASBESTOS PILES SITE SAMPLING AND ANALYSIS

| PROJECT PHASE | MEDIA -General Location | NUMBER OF SAMPLE LOCATIONS | NUMBER OF SAMPLES FOR ANALYSIS | DUPLICATES | FIELD BLANKS | TRIP BLANKS | DATES SAMPLES | LABORATORY ANALYSIS |
|---|---|---|---|---|---|---|---|---|
| PHASE 1A | AIR | | | | | | | |
| | Environmental | 4 | 4 | 0 | 1 | 1 | 12/24/87 | Asbestos (Transmission Electron Microscopy-TEM) |
| | Source | 6 | 6 | 1 | 1 | 1 | 1/9/87 | |
| | Receptor | 13 | 13 | 1 | 1 | 0 | 1/9/87 | |
| PHASE 1B (non-intrusive) | WATER | | | | | | | |
| | Surface Water-(Stream, Drainageway, and filter bed lagoons) | 10 | 10 | 1 | 0 | 1 | 3/30/87 | Asbestos (TEM/SAED-EDS)[1] |
| | | 6 | 6 | 4 | 1 | 1 | 1/15/87 | HSL Organics (VOC Extractables) |
| | | 4 | 4 | 1 | 0 | 1 | 3/3/87 | HSL Inorganics (metals, cyanide) |
| | | 6 | 6 | 4 | 1 | 0 | 1/15/87 | |
| | SOIL | | | | | | | |
| | Cover Material | 20 Grab<br>11 Shelby Tube | 10 | 0 | 0 | 0 | | Physical[2] |
| PHASE 1C (intrusive) | SEDIMENT | | | | | | | |
| | (Settling basins/ filter beds, Drainageway and Streams) | 10 | 10 | 1 | 1 | 0 | 3/30/87 | Asbestos (PLM)[3], |
| | | 7 | 7 | 1 | 1 | 1 | 1/29/87 | HSL Organics (VOC. Extractables) |
| | | 2 | 2 | 0 | 0 | 0 | 3/03/87 | |
| | | 7 | 7 | 1 | 1 | 0 | 1/29/87 | HSL Inorganics (metals, cyanide) |

AR001704

TABLE 4-2 (continued)
SUMMARY OF AMBLER ASBESTOS PILES SITE SAMPLING AND ANALYSIS

| PROJECT PHASE | MEDIA -General Location | NUMBER OF SAMPLE LOCATIONS | NUMBER OF SAMPLES FOR ANALYSIS | DUPLICATES | FIELD BLANKS | TRIP BLANKS | DATES SAMPLES | LABORATORY ANALYSIS |
|---|---|---|---|---|---|---|---|---|
| PHASE 1C | TEST PITS | 4 | 6 | 1 | 0 | 0 | | Asbestos (PLM) |
| | | | | | | | | HSL Organics |
| | | | 4 | 1 | 0 | 1 | | •VOC |
| | | | 4 | 1 | 0 | 0 | | •Extractables |
| | | | | | | | | HSL Inorganic |
| | | | 7 | 1 | 0 | 0 | | •Metals (EP Tox) |
| | | | 4 | 1 | 0 | 0 | | •Cyanide |
| | BORINGS and PIEZOMETERS | 12<br>8 | 74 | 6 | 5 | 0 | | Asbestos (PLM) |
| | | | 36 | 3 | 5 | 9 | | •VOC |
| | | | 35 | 3 | 5 | 0 | | •Extractables |
| | | | | | | | | HSL Inorganics |
| | | | 47 | 4 | 4 | 0 | | •Metals (EP Tox) |
| | | | 33 | 3 | 4 | 0 | | •Cyanide |
| | | | | | | | | Physical Testing[2] |
| | AIR | | | | | | | |
| | Environmental (taken during test pit excavation) | 4 | 4 | 1 | 1 | 1 | 4/14/87 | Asbestos (TEM) |
| | Personnel | 13 | 13 | 0 | 2 | 2 | 4/15/87 | Phase Contrast Microscopy PCM) |

TABLE 4-2 (continued)
SUMMARY OF AMBLER ASBESTOS PILES SITE SAMPLING AND ANALYSIS

| PROJECT PHASE | MEDIA -General Location | NUMBER OF SAMPLE LOCATIONS | NUMBER OF SAMPLES FOR ANALYSIS | DUPLICATES | FIELD BLANKS | TRIP BLANKS | DATES SAMPLES | LABORATORY ANALYSIS |
|---|---|---|---|---|---|---|---|---|
| POST PHASE 1C (following intrusive activities) | AIR | | | | | | | |
| | Environmental | 4 | 4 | 1 | 1 | 1 | | Asbestos (TEM) |
| | Source | 6 | 6 | 1 | 1 | 1 | 4/21/87 | Asbestos (TEM) |
| | | 8 | 8 | 1 | 1 | 1 | 7/87 * | |
| | Receptors | 17 | 17 | 2 | 1 | 1 | 4/21/87 | Asbestos (TEM) |
| | | 16 | 16 | 1 | 1 | 1 | 7/87 * | |
| | PIEZOMETERS (Aquious) | 8 | 8 | 1 | 1 | 1 | 7/87 | Asbestos (TEM/SAED-EDS) |
| | | 8 | 8 | 1 | 1 | 1 | 7/87 | HSL Inorganics (metals, cyanide) |

* A total of three sets of 24 sampling locations is planned. The final set will be performed in July 1987.

1 Transmission electron microscopy with selected area diffraction and energy dispersive x-ray spectrometry.

2 Grain size distribution, Atterberg Limits, triaxial or falling head permeability test, modified proctor test, and triaxial compression test (CIU) or direct shear. (See Table 5-1).

3 Polarized light microscopy with dispersion staining.

TABLE 5-1 SUMMARY OF PHYSICAL TESTING

AMBLER ASBESTOS PILES SITE

| BORING NO. | DEPTH(FT) STA | DEPTH(FT) END | RFW SAMPLE # | PHYSICAL TESTS: ATTERBERG LIMIT | GRAIN SIZE | MOISTR CONTNT | SPEC. GRTY | TRXL COMP. | TRXL PERM | UNCFD COMP. | CONSOL-IDATION | DIRCT SHEAR | SAMPLE TYPE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B1 | 42 | 44 | AAP-ST-B1-(42-44) | | | | | | | | | | SHELBY TUBE |
| B1 | 52 | 54 | AAP-ST-B1-(52-54) | T | T | T | T | T | T | T | | | SHELBY TUBE |
| B2 | 17 | 19 | AAP-ST-B2-(17-19) | T | T | T | | | T | T | | | SHELBY TUBE |
| B2 | 37 | 39 | AAP-ST-B2-(37-39) | T | T | T | | | | T | | | SHELBY TUBE |
| B3 | 10 | 12 | AAP-ST-B3-(10-12) | T | T | T | | T | T | | T | | SHELBY TUBE |
| B4 | 15 | 17 | AAP-ST-B4-(15-17) | | | | | | | | | | SHELBY TUBE |
| B4 | 27 | 29 | AAP-ST-B4-(27-29) | | | | | | | | | | SHELBY TUBE |
| B6 | 4 | 6 | AAP-ST-B6-(4-6) | | | | | | | | | | SHELBY TUBE |
| B6 | 12 | 14 | AAP-ST-B6-(12-14) | T | T | T | | | | T | | | SHELBY TUBE |
| B6 | 27 | 29 | AAP-ST-B6-(27-29) | T | T | T | T | T | T | T | T | | SHELBY TUBE |
| B7 | 4 | 6 | AAP-ST-B7-(4-6) | T | T | T | T | T | | T | | | SHELBY TUBE |
| B7 | 12 | 14 | AAP-ST-B7-(12-14) | T | T | T | | | | T | | | SHELBY TUBE |
| B8 | 6 | 8 | AAP-B8-ST-(6-8) | | | | | | | | | | SHELBY TUBE |
| B8 | 20 | 22 | AAP-B8-ST-(20-22) | T | T | T | | T | | | | | SHELBY TUBE |
| B12 | 6 | 8 | AAP-ST-B12-(6-8) | | | | | | | | | | SHELBY TUBE |
| B12 | 32 | 34 | AAP-ST-B12-(32-34) | | | | | | | | | | SHELBY TUBE |
| COVER SOIL | | | AAP-CS-PP-01 | T | T | T | | T | | | | | SHELBY TUBE |
| COVER SOIL | | | AAP-CS-PP-02 | T | T | T | | | | | | | DISTURBED |
| COVER SOIL | | | AAP-CS-PP-03 | T | T | T | | T | | | | | SHELBY TUBE |
| COVER SOIL | | | AAP-CS-PP-04 | T | T | T | | | T | | | | DISTURBED |
| COVER SOIL | | | AAP-CS-PP-05 | T | T | T | | | | | | | DISTURBED |
| COVER SOIL | | | AAP-CS-PP-06 | T | T | T | | | T | | | | SHELBY TUBE |
| COVER SOIL | | | AAP-CS-PP-07 | T | T | T | | T | | | | | SHELBY TUBE |
| COVER SOIL | | | AAP-CS-PP-08 | | | | | | | | | | DISTURBED |
| COVER SOIL | | | AAP-CS-PP-10 | T | T | T | | | | | | | DISTURBED |
| COVER SOIL | | | AAP-CS-PP-11 | | | T | | | | T | | | DISTURBED |
| COVER SOIL | | | AAP-CS-LP-01 | T | T | T | | T | | | | | SHELBY TUBE |
| COVER SOIL | | | AAP-CS-LP-02 | T | T | T | | | | | | | DISTURBED |
| COVER SOIL | | | AAP-CS-LP-03 | T | T | T | | T | | | | | SHELBY TUBE |
| COVER SOIL | | | AAP-CS-LP-04 | T | T | T | | | | | | | DISTURBED |
| COVER SOIL | | | AAP-CS-LP-05 | T | T | T | | | | | | | DISTURBED |
| COVER SOIL | | | AAP-CS-LP-06 | T | T | T | | T | | | | | SHELBY TUBE |
| COVER SOIL | | | AAP-CS-LP-08 | | | | | | T | | | | SHELBY TUBE |
| COVER SOIL | | | AAP-CS-LP-09 | | | | | | | | | | DISTURBED |
| COVER SOIL | | | AAP-CS-LP-11 | | | | | | T | | | | SHELBY TUBE |
| TEST PIT | | | TP-1B-(1-4) | | T | T | | | | | | T | DISTURBED |
| TEST PIT | | | TP-1B-(0-1) | | T | T | | | | | | T | DISTURBED |
| TEST PIT | | | TP-2A-(2-3.3) | | T | T | | | | | | T | DISTURBED |
| TEST PIT | | | TP-2A-(1-2) | | T | | | | | | | | DISTURBED |

T = TEST INDICATED AT TOP OF COLUMN PERFORMED

WESTON

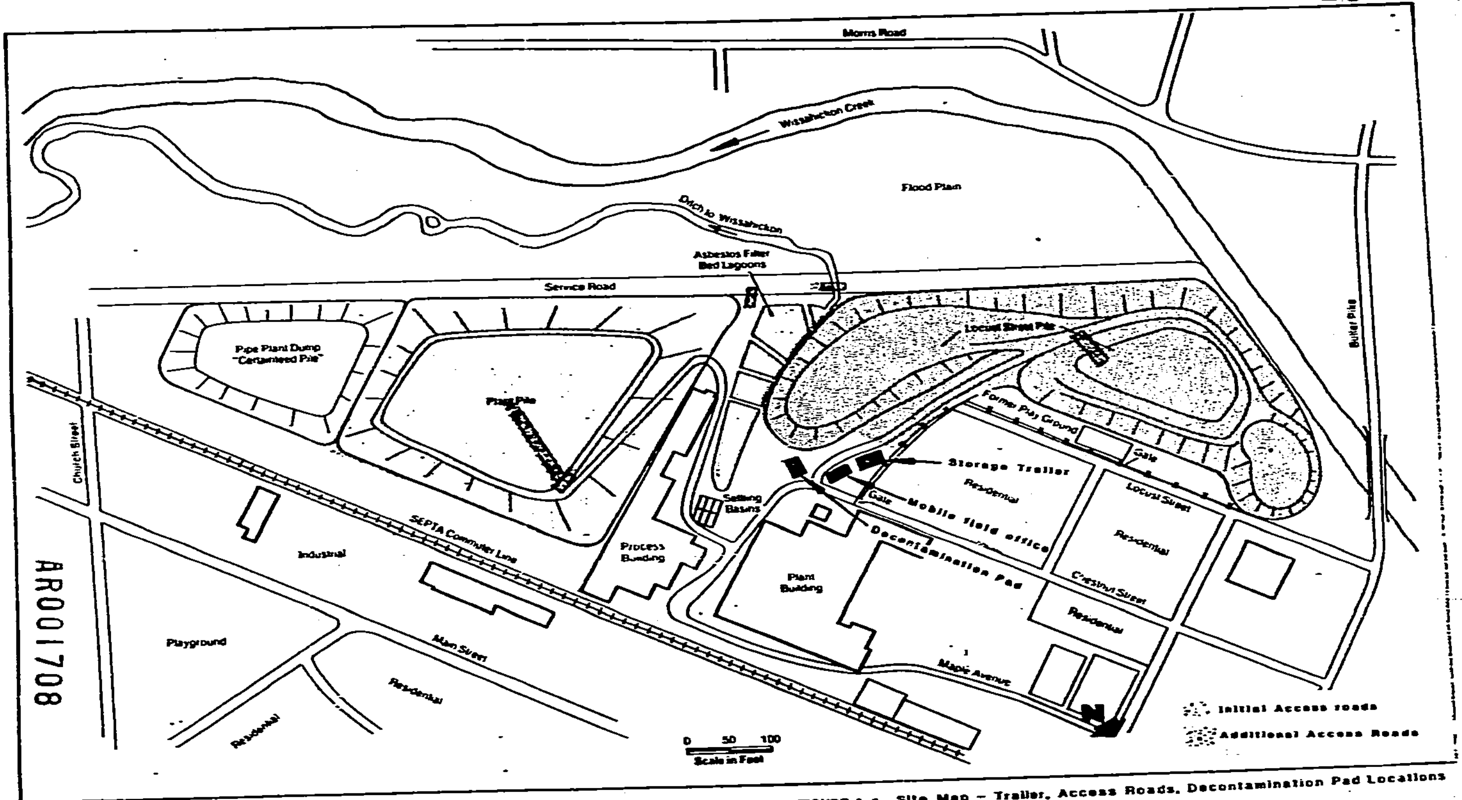
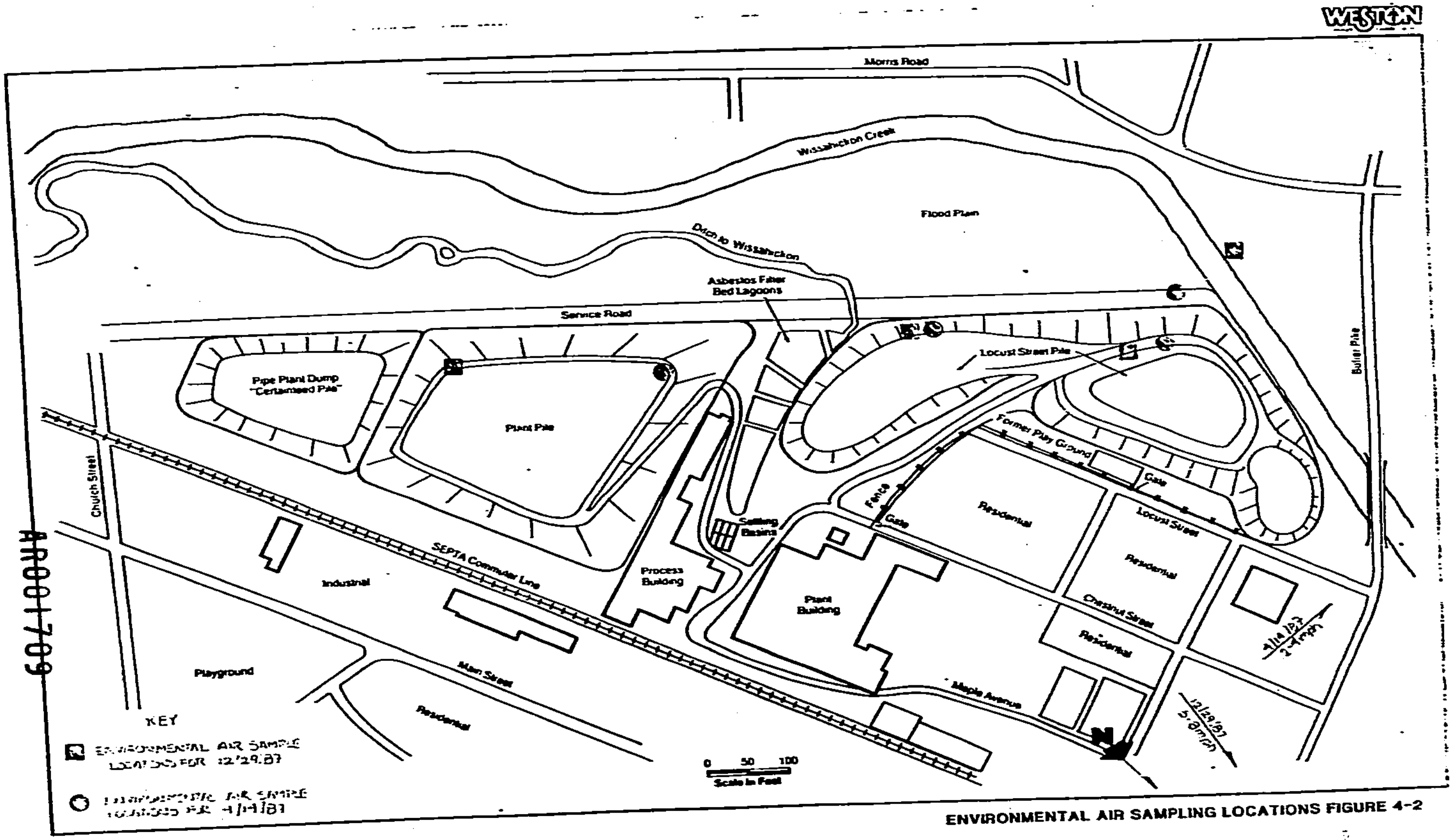


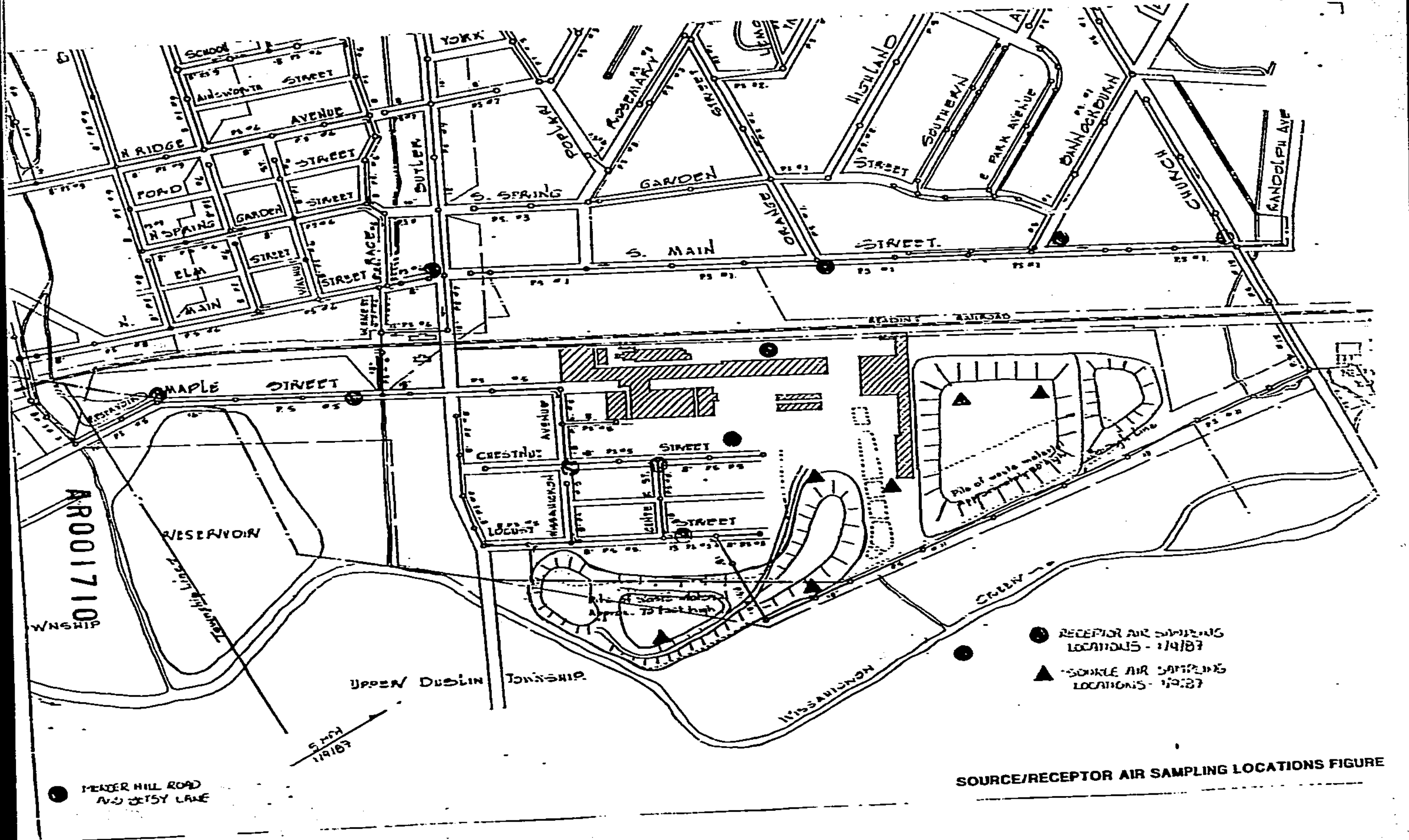

FIGURE 4-1 Site Map – Trailer, Access Roads, Decontamination Pad Locations

AR001708



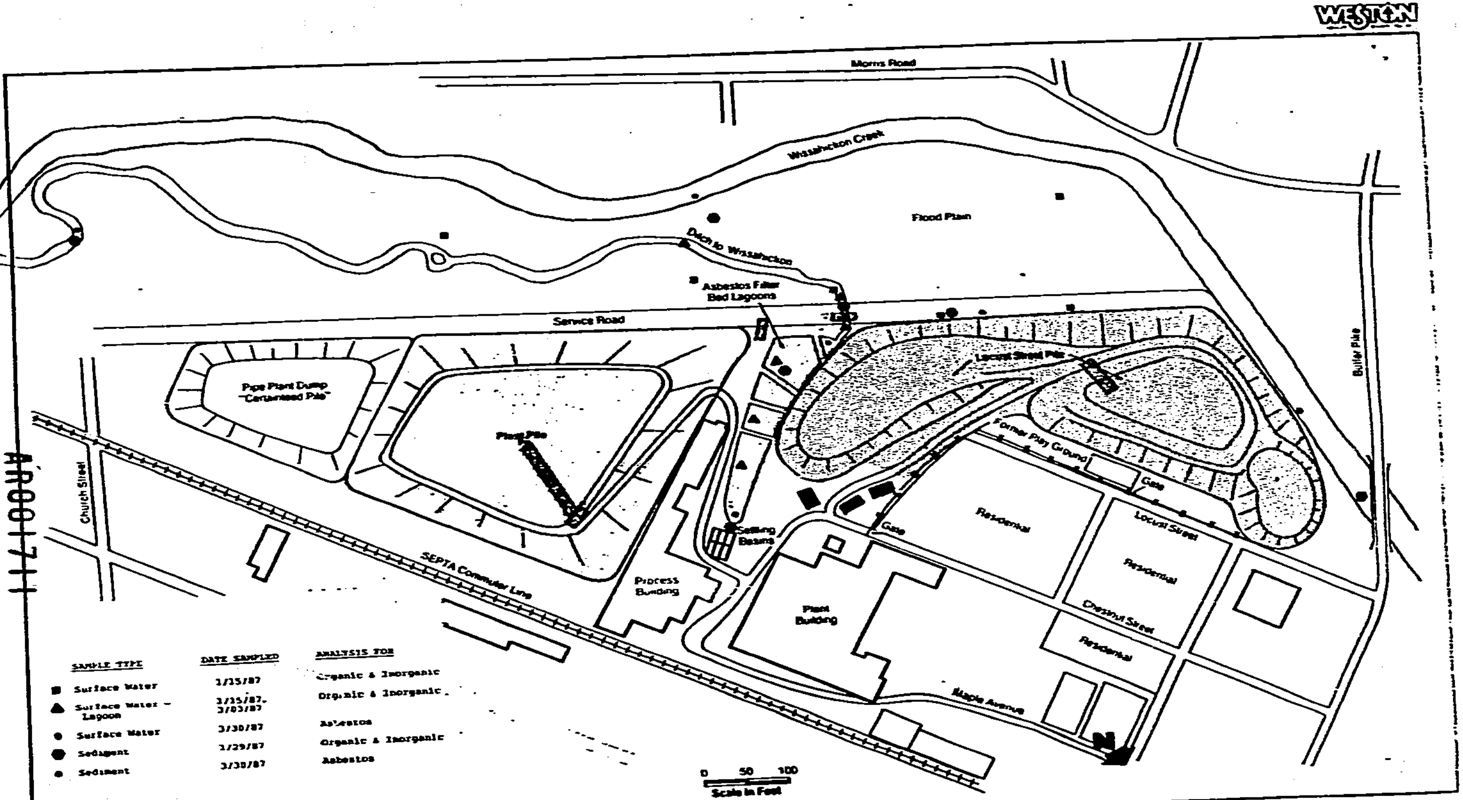

ENVIRONMENTAL AIR SAMPLING LOCATIONS FIGURE 4-2

AR001709




SOURCE/RECEPTOR AIR SAMPLING LOCATIONS FIGURE

AR001710




| SAMPLE TYPE | DATE SAMPLED | ANALYSIS FOR |
|---|---|---|
| ■ Surface Water | 3/35/87 | Organic & Inorganic |
| ▲ Surface Water – Lagoon | 3/35/87, 3/03/87 | Organic & Inorganic |
| ● Surface Water | 3/30/87 | Asbestos |
| ⬢ Sediment | 3/29/87 | Organic & Inorganic |
| • Sediment | 3/30/87 | Asbestos |

Figure 5-1 Surface Water and Sediment Sample Locations

AR001711

WESTON

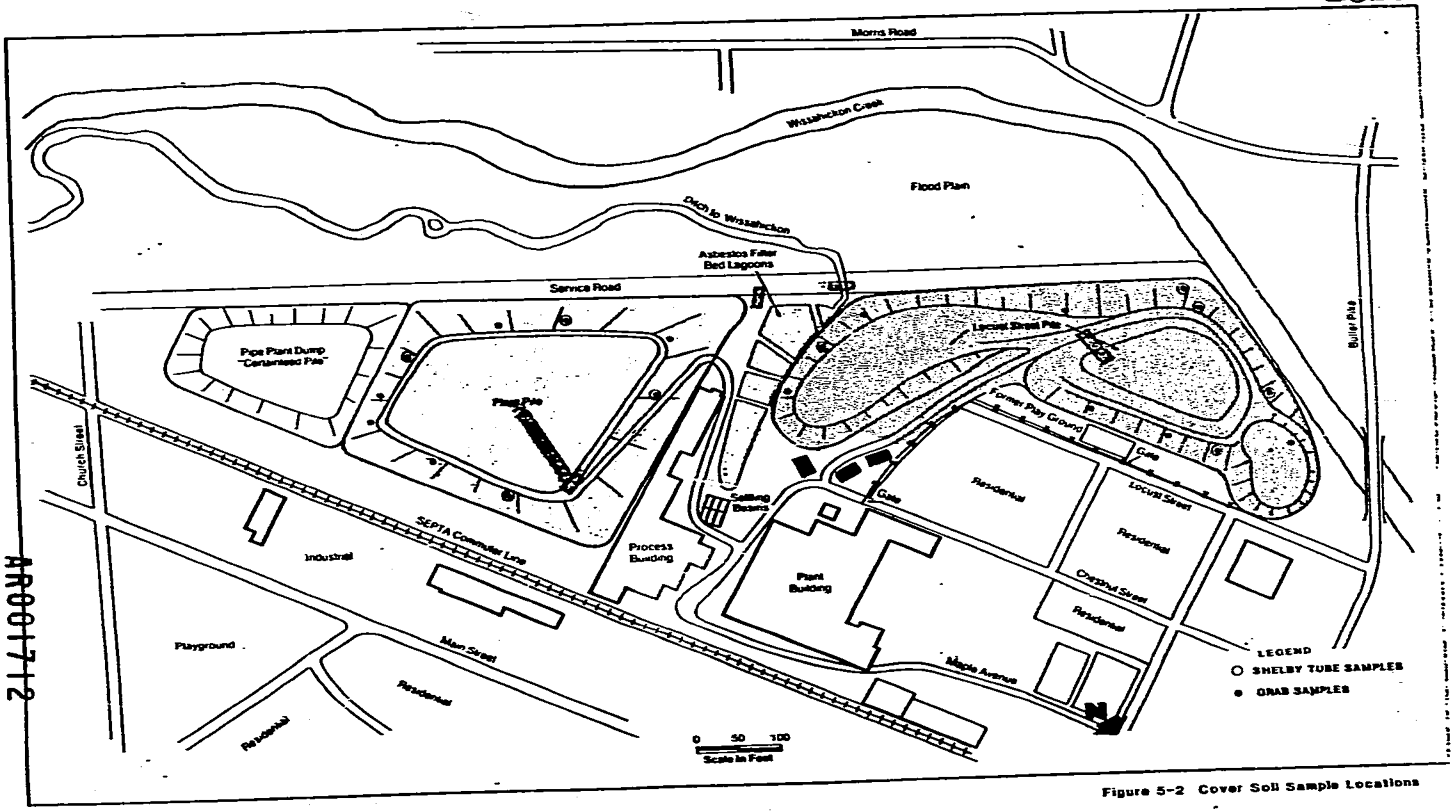



Figure 5-2 Cover Soil Sample Locations

AR001712

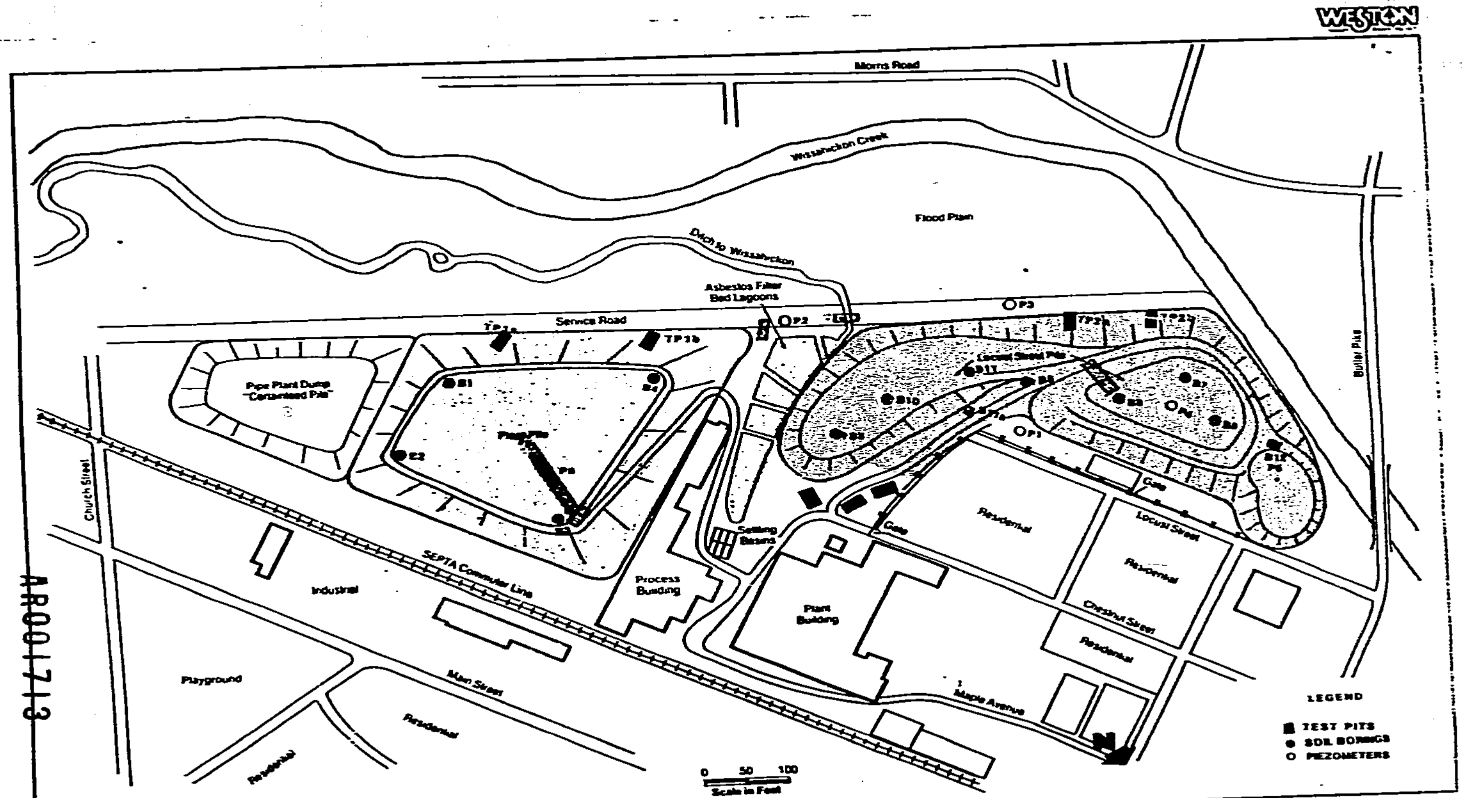
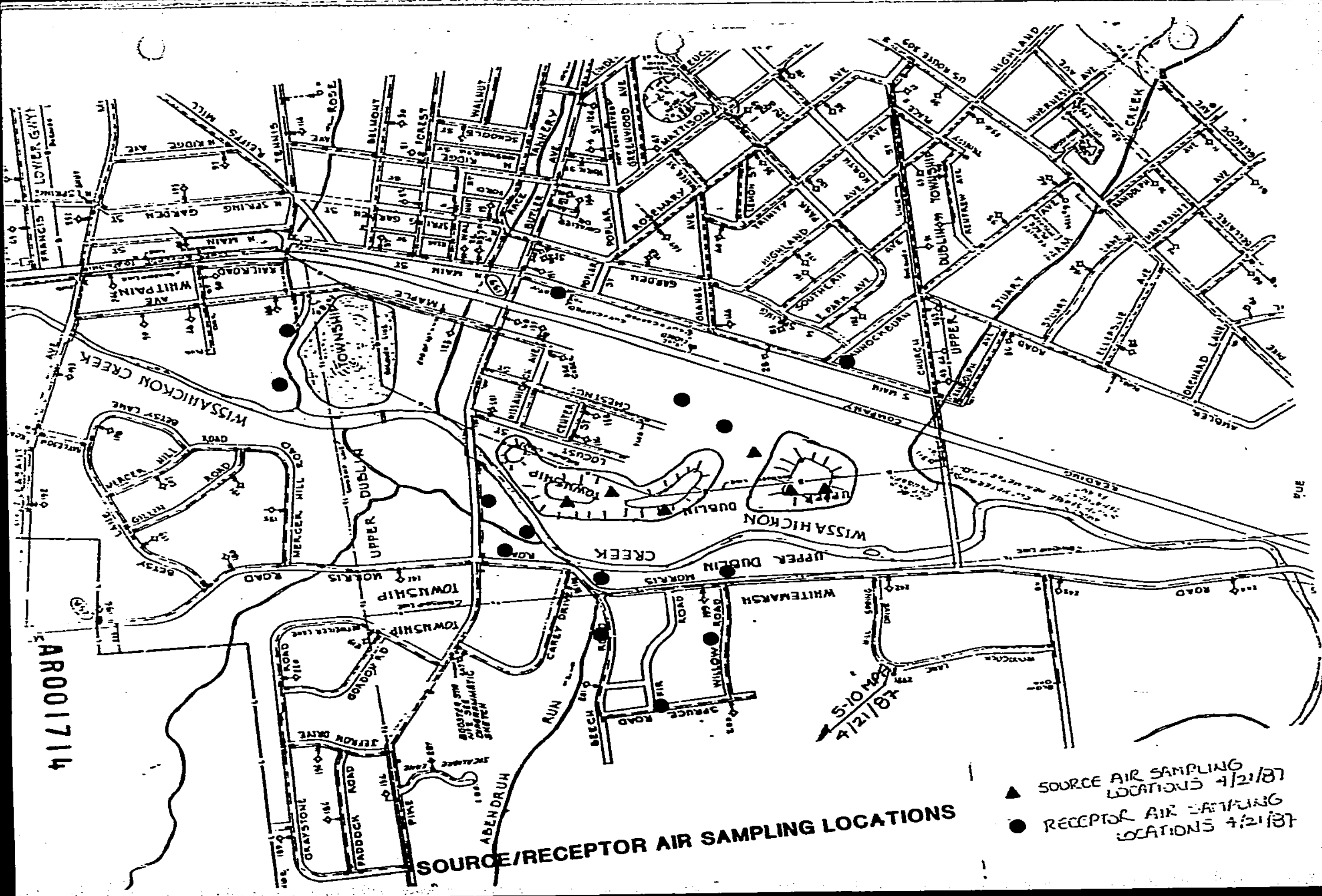



Figure 6-1 Test Pit, Soil Boring and Piezometer Locations

AR001713




SOURCE/RECEPTOR AIR SAMPLING LOCATIONS

▲ SOURCE AIR SAMPLING LOCATIONS 4/21/87

● RECEPTOR AIR SAMPLING LOCATIONS 4/21/87

AR001714